**Introduction to Cell Structure**

**An Overview of Cells**

All cells have several things in common. They all have a membrane and a gel-like material called cytoplasm inside the membrane. In addition, they all have something that controls the life of the cell. This control center is called either a nucleus or nuclear material.

Scientists describe two basic types of cells depending on whether they have a nucleus. Cells that have no membrane around their genetic material (DNA) are **prokaryotic** cells. All bacteria are prokaryotic cells. A **eukaryotic** cell has a nucleus with a membrane around it that separates the genetic material. All animal, plant, fungi and protist cells are eukaryotic cells.

**Cell Membrane**

Each cell in your body is constantly active and has a specific job to do. The activities in your cells might be compared to a business that operates 24 hours a day making dozens of different products. The business operates inside a building. Only materials that are needed to make specific products are brought into the building. Finished products are then moved out. A cell is similar. It functions within a structure called the cell membrane.

The **cell membrane** is a thin, flexible structure that forms the outer boundary of the cell and allows only certain materials to move into and out of the cell. Because only certain materials are allowed in and out, the cell membrane is called **semi-permeable**. The membrane is flexible. It is made up of a double layer of fats with some proteins scattered throughout. The cell membrane helps to maintain a chemical balance between materials inside and outside the cell. Food and oxygen move into the cell through the membrane. Waste products also leave through the membrane.

**Cytoplasm**

**Cytoplasm** is the gel-like material inside the cell membrane. Cytoplasm contains a large amount of water and many chemicals and structures that carry out the life processes in the cell. Unlike a gelatin dessert, however, the cytoplasm is constantly moving, or streaming.

The structures within the cytoplasm of eukaryotic cells are **organelles**. Each one has a specific job. Some organelles break down food. Others move wastes to be expelled from the cell. Still others store materials. Most organelles are surrounded by membranes which control what goes in and out.

**Nucleus**

The largest organelle in the cytoplasm of a eukaryotic cell is the **nucleus**, a structure that directs all the activities of the cell. The nucleus is like a manager who directs everyday business for the company. The nucleus contains genetic blueprints for the operations of the cell in its DNA. A structure called the **nucleolus** is also found in the nucleus.

A nucleus is separated from the cytoplasm by a nuclear envelope. Materials enter and leave the nucleus through openings, called pores, in the envelope.

Dear Students,

When you finish reading, you are going to take notes on this reading to write down important vocabulary, ideas, and examples. I recommend using the titles in the reading to organize your notes. When you take notes, do not copy directly from the reading- try to put things in your own words. One way to help you not to copy is this: don’t write in complete sentences. For example, under the section in your notes titled “Nucleus”, you might write: “Nucleolus- inside nucleus”. Please take the best notes possible, they will come in very handy in the future.

Mr. Jeremy